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JAMES C. EAVES JR.
GREENEBAUM DOLL & MCDONALD PLLC
3500 NATIONAL CITY TOWER
101 SOUTH FIFTH STREET
LOUISVILLE, KY 40202

EXAMINER

LEE, SHUN K

ART UNIT PAPER NUMBER

2884

DATE MAILED: 11/08/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/810,144

Applicant(s)

BALDWIN ET AL.

Examiner

Shun Lee

Art Unit

2884

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 September 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12, 14 and 15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 3-5, 8 and 9 is/are allowed.
- 6) ☒ Claim(s) 1, 2, 6, 7, 10-12, 14 and 15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 3/26/04, 8/11/04, & 4/26/05 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 14 September 2005 has been entered.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 14 and 15 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. New dependent claim 14 recites the limitation "the protective sheath has sufficient circumferential rigidity and has an inside diameter sized sufficiently close to an outside diameter of the flexible tube to prevent kinking of the flexible tube when both are bent together" and new dependent claim 15 recites the limitation "a flexible sheet of material substantially surrounding sidewalls of the flexible tube, the sheet of material being sufficiently durable to provide protection from abrasion

between the sheath and tube when the detector is bent". However, there does not appear to be a written description of the new claim limitations in the application as filed.

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1, 2, 6, 7, 10-12, 14, and 15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The specification (paragraph 20) states that " ... the flexible tube 12 may be made from any of a variety of materials having sufficient flexibility, strength and chemical resistance to the liquid scintillation material 16 being used. ... A preferred tubing material is a fluoropolymer plastic that sold by Norton Performance Plastics Corporation, of Wayne, N.J. under the trademark CHEMFLUOR. ... An acceptable fluoropolymer tubing is also sold by the same company under the trademark TYGON". Claim 1 contains the trademark/trade name TYGON and CHEMFLUOR. Where a trademark or trade name is used in a claim as a limitation to identify or describe a particular material or product, the claim does not comply with the requirements of 35 U.S.C. 112, second paragraph. See *Ex parte Simpson*, 218 USPQ 1020 (Bd. App. 1982). The claim scope is uncertain since the trademark or trade name cannot be used properly to identify any particular material or product. A trademark or trade name is used to identify a source of goods, and not the goods themselves. Thus, a trademark or trade name does not identify or describe the goods associated with the trademark or trade name. In the present case, the trademark/trade name is used to identify/describe

fluoropolymer (as disclosed at paragraph 20 of the specification) and, accordingly, the identification/description is indefinite.

The term "sufficient circumferential rigidity" in claim 14 is a relative term which renders the claim indefinite. The term "sufficient circumferential rigidity" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. The term "sufficiently close" in claim 14 is another relative term which renders the claim indefinite. The term "sufficiently close" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. Therefore, the claim is indefinite because the relationship of parts was not based on any known standard for sizing an inside diameter of the protective sheath to the outside diameter of the flexible tube, but on a flexible tube of unspecified build and unspecified bending during use.

The term "sufficiently durable" in claim 15 is a relative term which renders the claim indefinite. The term "sufficiently durable" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Murray *et al.* (US 2004/0051048) in view of Hurst *et al.* (US 4,471,223) in so far as understood.

In regard to claim 1, Murray *et al.* disclose (Fig.) a flexible scintillation-type radiation detector, comprising:

- (a) an elongated flexible tube (102) having first (106) and second (104) closed ends and defining therein a scintillation chamber, said tube (102) being made of a material selected from the group consisting of a fluoropolymer (paragraph 15);
- (b) liquid scintillation material (108) substantially filling the scintillation chamber;
- (c) said first closed end (106) including a substantially optically-transparent first end closure member (optical connection or window 106); and

(d) photodetection circuitry (112) operably positioned relative to the first end closure member to quantitatively detect scintillating photons generated in the scintillation liquid (108) indicative of radiation passing into the scintillation chamber.

The detector of Murray *et al.* lacks an opaque, flexible protective sheath substantially surrounding the flexible tube. However, scintillating fiber optics are well known in the art. For example, Hurst *et al.* teach (Fig. 1; column 2, lines 6-12) to provide a protective sheath (7) for optical fibers (6) and scintillating fibers (5) for use in combination with a source of nuclear radiation as a level sensing gauge. By definition, a protective sheath is an enveloping structure that protects. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to provide an opaque, flexible protective sheath substantially surrounding the flexible tube in the detector of Murray *et al.*, in order to protect the scintillating fiber optic detector when used in combination with a source of nuclear radiation as a level sensing gauge.

9. Claims 2 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Murray *et al.* (US 2004/0051048) in view of Hurst *et al.* (US 4,471,223) as applied to claim 1 above, and further in view of Nath (US 3,995,934) in so far as understood.

In regard to claims 2 and 6 which are dependent on claim 1, the modified detector of Murray *et al.* lacks an expansion chamber having a fixed volume and is in fluid communication with the scintillation chamber. Nath teaches (column 4, lines 7-23) to provide a fixed volume expansion chamber in fluid communication with the liquid wave guide, in order to maintain a constant liquid wave guide pressure despite temperature variations. Therefore it would have been obvious to one having ordinary

skill in the art at the time of the invention to provide a fixed volume expansion chamber in the modified detector of Murray *et al.*, in order to maintain a constant liquid wave guide pressure despite temperature variations.

10. Claims 2 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Murray *et al.* (US 2004/0051048) in view of Hurst *et al.* (US 4,471,223) as applied to claim 1 above, and further in view of Wojcik *et al.* (US 5,859,946) in so far as understood.

In regard to claims 2 and 7 which are dependent on claim 1, the modified detector of Murray *et al.* lacks an expansion chamber having a variable volume for accommodating volumetric expansion of the liquid scintillation material, the chamber being external of and in fluid communication with the flexible tube and including a movable wall therein. Wojcik *et al.* teach (Fig. 1) an expansion chamber (30) having a variable volume, the chamber (30) being external of and in fluid communication (26, 28) with the flexible tube (14) and including a movable wall (20) therein in order to accommodate volumetric expansion of a liquid scintillation material (16). Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to provide an expansion chamber in the modified detector of Murray *et al.*, in order to accommodate volumetric expansion of the liquid scintillation material.

11. Claims 10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Murray *et al.* (US 2004/0051048) in view of Hurst *et al.* (US 4,471,223) as applied to claim 1 above, and further in view of Majewski *et al.* ("Economical detectors based on

safe liquid scintillators", Nuclear Instruments and Methods in Physics Research A 414, pg. 289-298, 1998) and Meisner *et al.* (US 5,061,849) in so far as understood.

In regard to claims **10** and **11** which are dependent on claim 1, the modified detector of Murray *et al.* lacks a light reflector substantially surrounding the scintillation chamber and within the protective sheath and that the light reflector includes a flexible sheet substantially surrounding the sidewalls of the flexible tube. Majewski *et al.* teach (section 3 on pg. 291) to wrap TEFLON™ tape around the quartz cuvettes containing the scintillation liquid in order to optimize light collection. Further, the properties of commercially available TEFLON™ tape are well known in the art. For example, Meisner *et al.* teach (column 9, lines 59-62) teach that TEFLON™ tape are known as a reflector to those skilled in the art. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to wrap a flexible light reflective sheet substantially around the sidewalls of the flexible tube in the modified detector of Murray *et al.*, in order to optimize light collection.

12. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Murray *et al.* (US 2004/0051048) in view of Hurst *et al.* (US 4,471,223) as applied to claim 1 above, and further in view of Rozsa (US 6,407,390) in so far as understood.

In regard to claim **12** which is dependent on claim 1, the modified detector of Murray *et al.* lacks that the photodetection circuitry includes temperature sensing circuitry that compensates for a shift in the detection of scintillating photons as a result of temperature variation in the detector. However, scintillator temperature compensation is well known in the art. For example, Rozsa teaches (column 1, line10

to column 2, line 8) it is well known in the art to provide temperature sensing circuitry (e.g., comprising a thermistor) that compensates for a shift in the detection of scintillating photons as a result of temperature variation in the detector. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to provide temperature sensing circuitry in the modified detector of Murray *et al.*, in order to compensate for temperature variations.

13. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Murray *et al.* (US 2004/0051048) in view of Hurst *et al.* (US 4,471,223) as applied to claim 1 above, and further in view of McDermott (US 5,457,877) in so far as understood.

In regard to claim 14 which is dependent on claim 1, the modified detector of Murray *et al.* lacks that the flexible protective sheath prevents kinking. However, armored protective sheaths are well known in the art. For example, McDermott teaches (column 1, lines 11-35) that armored protective sheaths comprising metal layers and/or wire mesh are used as protective sheathing for fiber optics. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to provide an armored protective sheath in the modified detector of Murray *et al.*, in order to achieve maximum protection for the scintillating fiber optic detector when used in combination with a source of nuclear radiation as a level sensing gauge.

Allowable Subject Matter

14. Claims 3-5, 8, and 9 are allowed.

15. The following is a statement of reasons for the indication of allowable subject matter: the instant application is deemed to be directed to a nonobvious improvement

over the invention disclosed in US Patent Application Publication 2004/0051048. The improvements comprise in combination with other recited elements: (a) a slidable piston member is operably positioned in the scintillation chamber to define a variable volume expansion chamber free of liquid scintillation material adjacent to the second end as recited in claim 3 (and claims 4 and 5 which depend from claim 3); (b) a spring means positioned to bias a movable wall toward the liquid scintillation material as recited in claim 8; and (c) a member positioned to selectively immobilize the movable wall in a fixed position as recited in claim 9.

Response to Amendment

16. The declaration under 37 CFR 1.132 filed 14 September 2005 is insufficient to overcome the rejection of claims based upon Murray *et al.* in view of Hurst *et al.* as set forth in the last Office action because: it refer(s) only to the system described in the above referenced application and not to the individual claims of the application. Thus, there is no showing that the objective evidence of nonobviousness is commensurate in scope with the claims. See MPEP § 716.

It also include(s) statements which amount to an affirmation that the claimed subject matter functions as it was intended to function. This is not relevant to the issue of nonobviousness of the claimed subject matter and provides no objective evidence thereof. See MPEP § 716.

In view of the foregoing, when all of the evidence is considered, the totality of the rebuttal evidence of nonobviousness fails to outweigh the evidence of obviousness.

Response to Arguments

17. Applicant's arguments filed 14 September 2005 have been fully considered but they are not persuasive.

In response to applicant's argument (second paragraph on pg. 8 of remarks filed 14 September 2005) that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971). Applicant also argues that a person of ordinary skill in the art would not be led to modify the radiation detector of Murray *et al.* for use as a level sensing gauge since using a neutron emitting isotope as the source for an industrial level sensing gauge would be inappropriate because it is both unnecessarily dangerous and expensive. Examiner respectfully disagrees. Industrial level sensing gauges using neutrons are well known in the art (see e.g., US 4,870,278). Thus it would have been obvious to one of ordinary skill in the art that radiation (e.g., neutrons and/or gamma rays) detectors have been used in the prior art for fluid level detection.

Applicant argues (last paragraph on pg. 8 of remarks filed 14 September 2005) that the flexible tube must be made of either TYGON®, CHEMFLUOR®, or a substantially equivalent material having substantially equivalent properties. As

discussed above, a trademark or trade name is used to identify a source of goods, and not the goods themselves. Further, applicant does not explain nor distinctly claim a set of expressly defined physical properties necessary for the material of the flexible tubing. Therefore, applicant's arguments that the Teflon® AF (Amorphous Fluoropolymer) of Murray *et al.* is not substantially equivalent to the fluoropolymer disclosed in paragraph 20 of the specification as filed are not persuasive.

In response to applicant's argument (second paragraph on pg. 9 of remarks filed 14 September 2005) that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (*i.e.*, no neutrons) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). There does not appear to be an express definition of "ionizing nuclear radiation" as excluding neutrons, nor has applicant pointed out where in the application "ionizing nuclear radiation" is expressly defined as excluding neutrons.

In response to applicant's argument (third paragraph on pg. 9 to second paragraph on pg. 10 of remarks filed 14 September 2005) that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (*i.e.*, a movable wall within the variable volume expansion chamber) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). In this case, claim 7

recites the limitation "the expansion chamber has a variable volume, the chamber being external of and in fluid communication with the flexible tube and including a movable wall therein". Thus the expansion chamber has a movable wall where the variable volume of the expansion chamber changes as the movable wall moves. Therefore, the claim as recited does not include the limitation of a wall within the expansion chamber.

Applicant argues (third paragraph on pg. 10 to third paragraph on pg. 11 of remarks filed 14 September 2005) that the cited prior art are not combinable since the structures of Wojcik *et al.* and Nath are mutually exclusive. Applicant's arguments with respect to claim 6 have been considered but are moot in view of the new ground(s) of rejection. Moreover even considering applicant's arguments, Nath states (column 4, lines 15-23) that "Instead of an elastic liquid supply container it is also possible to provide a supply container with rigid walls, which is filled partly with a gas under pressure. The use of such an serves to keep constant the pressure, acting upon the liquid 4 in the flexible tube 3, despite variations in temperature and the like so that variations in density and transmission, which might reduce the transmission, are avoided". Thus Nath expressly teaches a rigid container as an alternative to an expansion chamber having a variable volume, in order to avoid variations in density and transmission due to temperature variations.

Applicant argues (last paragraph on pg. 11 to second paragraph on pg. 12 of remarks filed 14 September 2005) that the TEFLON™ tape of Majewski *et al.* is not a reflector. Applicant's arguments with respect to claims 10 and 11 have been considered but are moot in view of the new ground(s) of rejection.

Applicant argues (last two paragraphs on pg. 12 of remarks filed 14 September 2005) that there is no suggestion that the Rozsa invention would be applicable to the structure disclosed in Murray *et al.* Examiner respectfully disagrees. Rozsa states (column 1, lines 13-20) that "A typical scintillation detector employs a scintillator, such as NaI(Tl), and a photo-detector, such as a photomultiplier tube (PMT), for detecting ionizing radiation, e.g., x-rays, gamma rays and particles such as electrons and alpha particles. The response of the aforesaid scintillation detector usually is temperature dependent, i.e., varies as the ambient temperature changes". Thus Rozsa teaches that a scintillation detector is temperature dependent. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to provide temperature sensing circuitry in the modified detector of Murray *et al.*, in order to compensate for temperature variations.


Conclusion

18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shun Lee whose telephone number is (571) 272-2439. The examiner can normally be reached on Tuesday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Porta can be reached on (571) 272-2444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SL


CONSTANTINE HANNAIER
PRIMARY EXAMINER